Electric Energy Storage

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California Public Utilities Commission

2011 Integrated Energy Policy Report Committee

Workshop on Energy Storage for Renewable Integration

Sacramento, CA

April 28, 2011

A quick disclaimer

- The content of today's talk is meant to represent staff thinking but is not reflective of an official Commission Decision
  - We are doing a rulemaking, in part, to develop the CPUC's official position

AB 2514 Basics

- Requires the CPUC by **March 2012** to open a proceeding
  - Determine, if any, appropriate targets, for each load serving entity to procure viable and cost-effective energy storage systems
- Requires the CPUC by **October 2013** to adopt for the IOUs an energy storage system procurement target
  - Target only if appropriate
  - Milestones of 2015 and 2020
  - Similar milestones for non-IOUs

AB 2514 Policy Goals

- An energy storage system shall **be cost effective** and either**:**
  - Reduce GHG emissions
  - Reduce peak demand
  - Defer/substitute for an investment in generation, transmission or distribution assets
  - Improve reliable grid operations
- Renewable integration, while critical, is not the only policy driver we need to examine

Cost-Effectiveness

- The CPUC can consider a variety of possible policies to encourage cost-effective deployment of energy storage systems:
  - Refinement of existing procurement methods
  - Consider different contract and ownership models
- Costs are immediate and known; benefits are long term and diffuse
- Key question: How do we properly value storage on our system?

CPUC's activities

- July 2010: CPUC releases Staff White Paper on barriers and opportunities for energy storage
- December 2010: The CPUC launches the Energy Storage proceeding
- March 2011: Hosted workshop to start to bring parties together on emerging topics
- April 2011: Hosted "pre-hearing conference" to help determine scope and schedule
- May 2011: Scoping Memo anticipated

Key Questions to Consider

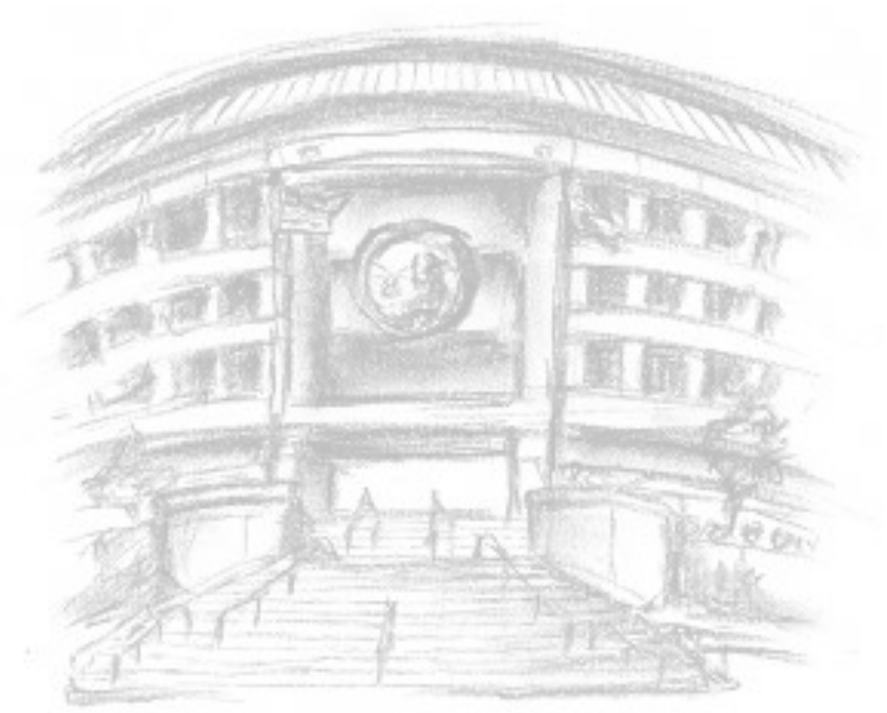
- What is the current status of the energy storage market?
  - Given rapid technological change, can a general policy framework be sufficient?
- What are we trying to accomplish from increased penetration of energy storage?
- What are the primary “applications” of energy storage?
- Are there unique market/regulatory barriers to storage?
  - Either at the CPUC or at the FERC or the CAISO?
- How does storage connect with other resources in the loading order as established by the Energy Action Plan?

The balance

As we move forward, we need to balance the goals between ratepayer interests, cost-effectiveness, integration with either renewable/intermittent resources AND non-dispatchable resources to ultimately send a clear signal to this emerging market

Thank you!
For Additional Information:

www.cpuc.ca.gov



Panel 3: Utilities Perspective on Energy Storage

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Application Approach

- Where does it make sense to put storage?
  - What benefits does putting storage in that particular point on the grid
  - Can be multiple depending on the context
- Can something else also achieve those benefits?
- Can we achieve the benefits from storage in a different more cost-effective manner?

Application Example

- Storage paired with a wind farm under a long-term contract under the RPS
- Storage behind the meter with a small DG asset, such as CHP or solar, avoiding utility retail rates
  - Very different applications and yet similar problems arise – what is specific and what is general?

Ownership Model

- CPUC is trying to be agnostic in terms of who “owns” the storage asset
  - The end-use customer, a third party developer, the resource generator or the utility could own storage, depending on the context
  - Does the ownership model depend on the Application where the storage is being used?
  - Question of financing – is a long term contract the only way? What about rate design?

Leverage ARRA funds for RDD&D

- A variety of storage projects were approved leveraging RDD&D funds
- However, not all storage is long-term
  - Balance between what's available today and what we can learn today